

NEW ENGLAND NOTE

FIRST RECORDS OF A EUROPEAN MOSS,
PSEUDOSCLEROPODIUM PURUM,
NATURALIZED IN NEW ENGLAND

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Pseudoscleropodium purum (Hedw.) Fleisch. *in* Broth. MASSACHUSETTS. Middlesex Co., Mount Auburn Cemetery, Cambridge, ca. 1 km south of Fresh Pond: soil, mowed lawn, north-facing slope under deciduous tree canopy, between Trefoil and Bellwort paths, 1 Apr 2000, *Miller 12911* (NYS); on soil in rough lawn in shade of deciduous trees, above Rose Path, northeast of Tower, 1 Apr 2000, *Miller 12912* (NYS); soil, sparse lawn near grove of *Picea abies* trees, east and southeast and above Dell Pond, 1 Apr 2000, *Miller 12910* (NYS); shaded lawn among grass, inside Scots' Charitable Society Plot enclosure, tree canopy largely deciduous, 13 May 2000, *Miller 12985* (NYS, FH). Newton Cemetery, ca. 1.5 km west of Newton Center: damp soil, south side of central pond, mowed lawn behind Richards crypt under and near large *P. abies* trees, 13 May 2000, *Miller 12986* (NYS, FH).

Elsewhere is detailed the recent discovery of *Pseudoscleropodium purum* in New York, where this moss has been found to be widespread in the southern part of the state, from near Buffalo eastward to the Albany area (Miller and Trigoboff, in press). A large (to 8 cm long), pinnately branched feather-moss, native to Europe, *P. purum* had been observed in other parts of North America prior to its being recognized in New York. These include Washington State and adjacent British Columbia (especially in and near Seattle and Vancouver; Lawton 1960; Schofield 1965), eastern Michigan (near Ann Arbor; Rohrer and Kirkpatrick 1985), and St. John's, Newfoundland (Brassard 1983). Lawns, gardens, and fields are where this moss has been found most frequently in North America so far, suggesting that its establishment and dispersal are closely linked to horticultural practices and lawn care. The year and method of its introduction into northeastern North America are unknown.

My field studies in New York State revealed that *Pseudoscleropodium purum* occurred commonly in regularly mowed cemetery lawns on moist, clayey soil shaded by conifers (particularly *Picea abies* and *Thuja occidentalis*). While I have searched for this moss at other sites that seemed promising, for example, village commons and parks with lawns shaded by *P. abies*, I have found it only twice in places other than cemeteries. Both of these are in Cortland, New York (lawns of the Municipal Water Works and the City water tower). Thus, in New York at least, *P. purum* appears to occur in managed plant communities.

Nowhere in North America, so far, has *Pseudoscleropodium purum* been found to produce spores, so it seems likely that its dispersal takes place when plant fragments are transported by unknown vectors, ones perhaps associated with lawn care or the nursery and horticultural trades. Populations of male and female plants (this moss is dioicous) have been found in New York in different cemeteries in Rensselaer County, which was intensively surveyed for *P. purum* (Miller and Trigoboff, in press), indicating that a potential exists for its reproduction by spores in the northeastern United States. Female plants have been found in Massachusetts in the Newton Cemetery population, but those in Mount Auburn Cemetery were sexually undifferentiated at the time of collection.

I evaluated how widespread *Pseudoscleropodium purum* was in eastern Massachusetts by surveying the bryoflora of 18 cemeteries in Norfolk, Middlesex, and Suffolk counties, in an area of about 800 km² bounded by the towns of Framingham, Maynard, Acton, Bedford, Malden, Milton, and Natick. In addition, I examined parts of the Arnold Arboretum, Jamaica Plain (Boston), where conifers and mowed lawn occurred together. The inventory target areas were chosen utilizing the Boston North, Boston South, Framingham, and Maynard 1:25,000 metric U.S. Geological Survey topographic maps. Criteria used to select the sites included large size and prominence within the community (in eastern Massachusetts, these two factors often indicate that a cemetery was founded in the 1800s), tree cover (green overprint on the maps), and location (sites more or less evenly scattered throughout the study area). While turf mosses varied from abundant to sparse in all cemetery lawns I examined, *P. purum* occurred in only two of them, as indicated above. Moreover, my search at the Arnold Arboretum was unsuccessful.

Because *Pseudoscleropodium purum* may eventually spread to cemeteries and other places in eastern Massachusetts where it does not now occur, I list here those I searched without success in May 2000: Norfolk Co.—Milton (Town of Milton), Woodlawn (Wellesley); Middlesex Co.—Edgell Grove (Framingham), Forest Dale (Malden), Glenwood (Maynard), Glenwood (Natick), Lakeview (Wayland), Oak Grove (Medford), Ridgelawn (Watertown), St. Patricks (Watertown), Shawsheen (Bedford), Sleepy Hollow (Concord), Westview (Lexington), Wildwood (Winchester), Woodlawn (Acton); and Suffolk Co.—Forest Hills (Boston). The success rate, 11% (2 occurrences, 18 searched areas), was about the same as that obtained in the survey of Rensselaer County, New York. There, *P. purum* was found at 14 of 70 sites (20%), but about twice as much area was surveyed (1800 km²).

In contrast to cemeteries in Rensselaer County, those in eastern Massachusetts contained fewer small groves of *Picea abies*, and therefore were locally less shaded. However, soil differences between the two regions are perhaps more important. Soil in the eastern Massachusetts cemeteries I visited was generally well drained and sandy or loamy, and wind exposure was greater owing to hilltop, ridge, or slope locations. More acid soils also characterize cemeteries in eastern Massachusetts on the basis of the absence of bryophytes associated with basic or circumneutral, calcareous soil. While a search for more stations of *Pseudoscleropodium purum* in eastern Massachusetts could be productive and should be pursued, the edaphic differences between eastern Massachusetts and New York habitats may prove to be significant determinants of different patterns of lawn moss occurrence in these two regions.

Pseudoscleropodium purum is more widely naturalized in North America than reported in the most recent regional floras (e.g., Crum and Anderson 1981). It is uncertain whether this moss will become invasive in the New York–New England region. It is so in New Zealand where male and female plants grow together and spores are produced (Lewinsky and Bartlett 1982). Additional systematic observation and field surveys are needed in northeastern North America to track the status and abundance of *P. purum*.

LITERATURE CITED

- BRASSARD, G. R. 1983. *Pseudoscleropodium purum* in Newfoundland, Canada. *J. Bryol.* 12: 618–619.

- CRUM, H. A. AND L. E. ANDERSON. 1981. Mosses of Eastern North America. 2 vols. Columbia University Press, New York.
- LAWTON, E. 1960. *Pseudoscleropodium purum* in the Pacific Northwest. Bryologist 63: 235–237.
- LEWINSKY, J. AND J. BARTLETT. 1982. *Pseudoscleropodium purum* (Hedw.) Fleisch. in New Zealand. Lindbergia 8: 177–180.
- MILLER, N. G. AND N. TRIGOBOFF. In press. A European feather moss, *Pseudoscleropodium purum*, naturalized widely in New York State in cemeteries. Bryologist 104(1).
- ROHRER, J. R. AND H. E. KIRKPATRICK. 1985. *Pseudoscleropodium* discovered in the Great Lakes region. Bryologist 88: 24–25.
- SCHOFIELD, W. B. 1965. Correlations between the moss floras of Japan and British Columbia, Canada. J. Hattori Bot. Lab. 28: 17–42.